Indoor Air Quality Monitor

March 2003

North Dakota Department of Health

Eye on Events

Dakota Super Kids Asthma Camp

The annual "Dakota Superkids Asthma Camp" sponsored by the American Lung Association of North Dakota (ALAND) will be held June 15 through 21, 2003. Kids enjoy a week of fun while learning self-help asthma management skills. To register or for more information, contact ALAND at 1.800.ALA.NDAK.

NEHA 2003 IAQ Conference

The National Environmental Health Association (NEHA) 2003 Indoor Air Quality Conference will be in Reno, Nev. June 8 to 11, 2003 at the Reno Hilton Hotel. For more information, see the calendar of events at http://www.neha.org/ or call NEHA at 303.756.9090.

State of Science on Molds and Human Health

More than 50,000 species of fungi exist in the world. Fungi are important because they are the decomposers of the world – they break down organic matter so it can be reused by plants and animals.

Mold, one type of fungi, is found virtually everywhere and thrives in damp environments. More than 1,000 different molds have been identified in indoor environments.

In 2002, the Centers for Disease Control and Prevention (CDC) addressed the U.S. House of Representatives regarding mold and human health.

The statement, entitled, "State of Science on Molds and Human Health," was made by Stephen C. Redd, M.D., the lead CDC scientist on air pollution and respiratory health.

Dr. Redd's statement discussed what is known and what is not known about the health effects of mold. For instance, when exposed to extensive mold growth indoors, people can experience illnesses such as allergic rhinitis, allergic asthma and hypersensitivity pneumonitis.

Data also shows that exposure to mold can exacerbate asthma conditions in asthmatics. Mold also can cause infections in people who are immunocompromised. Dr. Redd reported that 9 percent of hospital-acquired infections are caused by fungi.

Mold behind wallpaper

In addition, two mold-produced toxins have been classified by the National Toxicology Program as human carcinogens.

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What is unknown about the health effects of mold is whether mold causes health effects such as pulmonary hemorrhage, memory loss, or lethargy. There is no system to track public exposure and or the health effects of mold, so it is unknown whether the prevalence of mold-related health effects is increasing.

The complete statement by Dr. Stephen Redd, M.D., can be viewed online at: http://www.cdc.gov/nceh/airpollution/images/moldsci.pdf

Ozone Generating Air Purifiers

As concerns over indoor mold rise, people are looking for quick and inexpensive ways to clean the air they breath indoors. One system that is being promoted is the use of ozone-generating air purifiers.

While the basic oxygen molecule is composed of two oxygen atoms, ozone is a molecule of three oxygen atoms.

Ozone is an unstable molecule. The third oxygen atom will detach readily from the molecule and react with other matter. This type of reaction is called oxidation.

Ozone can be generated naturally by lightening.

Ozone that oxidizes organic matter such as mold spores or bacteria often kills the organism, giving ozone antimicrobial properties.

However, the same chemical properties that allow ozone to react with organic material outside the body give it the ability to react with similar organic material inside the body, potentially causing harmful health consequences for those who are exposed to it.

Relatively low amounts can cause chest pain, coughing, shortness of breath and throat irritation. Ozone also may exacerbate chronic respiratory diseases such as asthma and may compromise the ability of the body to fight respiratory infections.

Terms such as "energized oxygen," "activated oxygen" or "pure air" have been used as synonyms for ozone by some manufacturers and vendors of ozone devices. These terms may suggest that ozone is a healthy kind of oxygen, but ozone can be a toxic gas and has vastly different properties than oxygen.

Several agencies have established health standards or recommendations to limit human exposure to ozone. The OSHA permissible exposure limit (PEL) for workers is 0.10 parts per million (ppm) ozone for an eight-hour period. The national ambient air standard for ozone is 0.08 ppm for any eight-hour average.

More information about ozone and ozone air purifiers can be found on the web at http://www.epa.gov/iaq/pubs/ozonegen.html

IAQ Colleague

James Heckman and his wife, Mari

The indoor air quality colleague for this issue is James Heckman, director of the Environmental Health Division at First District Health Unit (FDHU) in Minot, N.D.

Before working at FDHU, James was employed by Three Affiliated Tribes, where his work included managing the U.S. EPA Clean Water Act and Clean Air Act programs.

James received bachelor's degrees in earth science and business management from Minot State University. While in school, he completed a well head protection program for the city of Minot in the Sundre Aquifer system.

James said, "As a third generation farmer/rancher, I have a lifetime of environmental work because farmers never throw anything away ... it's always recycled."

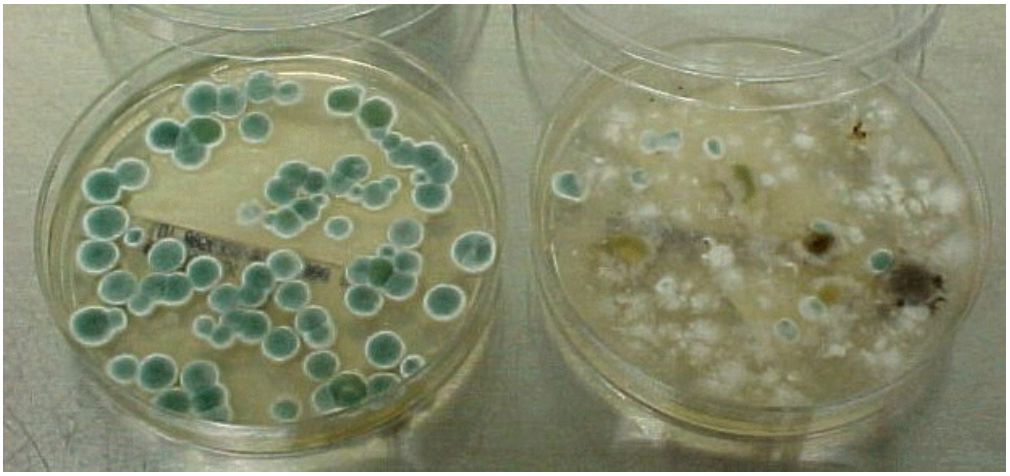
James enjoys traveling, golfing, boating and working on old cars.

Tool Talk: Indoor Air Quality Equipment Review

As public awareness of the potential health effects of exposure to indoor mold increases, the concerns regarding indoor mold will grow. It is not surprising that people want to know if a mold problem exists in their homes.

The easiest way to determine whether a mold problem exists in a building is seeing or smelling mold in a building. However, in some cases, mold may be growing in places that are difficult to observe, such as inside wall cavities or behind wallpaper.

When a mold problem is suspected but cannot to be found, testing may help determine whether a problem exists. There are several ways to test for mold; however, one type of test kit that should be avoided is the do-it-yourself mold test kit. Typically do-it-yourself mold test kits involve setting a nutrient agar petri plate out on the floor or exposing it to a ventilation supply vent, incubating the plate and then observing it for mold growth.



Penicillium, Cladisporium and Alternaria species of mold on nutrient agar sampling plates

A nutrient agar sampling plate taped to a ventilation supply vent

There are multiple problems with this type of kit. First, mold spores are found virtually everywhere in nature and are present in buildings whether a mold problem exists or not. Simply finding mold spores indoors is not an accurate indicator of the presence of a mold problem.

Second, because mold is everywhere, a comparison of mold levels must be made to determine if there is a problem. Since there is no health-based standard for mold, it is important to compare the levels of mold indoors to the levels of mold outdoors at the same time and locale in order to determine effectively if an indoor source could be present.

The do-it-yourself mold test kits do not typically involve taking samples outdoors for comparison and do not sample a measured quantity of air needed in order to quantify the amount of mold present per unit volume of air.

Proper mold sampling involves specialized equipment. Analyzing mold samples requires professional judgement and training in the fields of microbiology and environmental health.

A person interested in having indoor samples taken for mold should contact a professional environmental consultant who has been trained and has experience taking and analyzing indoor air mold samples.

For more information, contact Jesse Green, North Dakota Department of Health at 701.328.5188.

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Questions? Comments? Suggestions? Something to add to the next issue? Call Jesse Green at 701.328.5188